RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Borehole 41-12-02

Log Event A

Borehole Information

Farm : SX **Tank :** SX-112 **Site Number :** 299-W23-111
N-Coord : 35,277 **W-Coord :** 75,832 **TOC Elevation :** 661.48
Water Level, ft : **Date Drilled :** 3/26/1962

Casing Record

Type : Steel-welded **Thickness :** 0.280 **ID, in. :** 6
Top Depth, ft. : 0 **Bottom Depth, ft. :** 125

Equipment Information

Logging System : 1 **Detector Type :** HPGe **Detector Efficiency:** 35.0 %
Calibration Date : 03/1995 **Calibration Reference :** GJPO-HAN-1

Logging Information

Log Run Number : 1 **Log Run Date :** 7/11/1995 **Logging Engineer:** Mike Widdop
Start Depth, ft.: 0.0 **Counting Time, sec.:** 100 **L/R :** L **Shield :** N
Finish Depth, ft. : 13.5 **MSA Interval, ft. :** 0.5 **Log Speed, ft/min.:** n/a

Log Run Number : 2 **Log Run Date :** 7/12/1995 **Logging Engineer:** Mike Widdop
Start Depth, ft.: 13.5 **Counting Time, sec.:** 100 **L/R :** L **Shield :** N
Finish Depth, ft. : 42.0 **MSA Interval, ft. :** 0.5 **Log Speed, ft/min.:** n/a

Log Run Number : 3 **Log Run Date :** 7/13/1995 **Logging Engineer:** Mike Widdop
Start Depth, ft.: 42.0 **Counting Time, sec.:** 100 **L/R :** L **Shield :** N
Finish Depth, ft. : 67.0 **MSA Interval, ft. :** 0.5 **Log Speed, ft/min.:** n/a

Log Run Number : 4 **Log Run Date :** 7/13/1995 **Logging Engineer:** Mike Widdop
Start Depth, ft.: 113.0 **Counting Time, sec.:** 100 **L/R :** L **Shield :** N
Finish Depth, ft. : 106.5 **MSA Interval, ft. :** 0.5 **Log Speed, ft/min.:** n/a

Analysis Information

Analyst : D.C. Stromswold
Data Processing Reference : Data Analysis Manual Ver. 1 Analysis Date : 11/20/1995

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Analysis Notes :

Borehole 41-12-02 was logged in four runs in a move-stop-acquire mode that collected spectra for 100 seconds every 0.5 ft. Gain drifts during runs 2 and 3 necessitated multiple energy calibrations during data processing to maintain proper radionuclide identification, whereas runs 1 and 4 were analyzed using only one energy calibration for each run. No data were acquired in the intervals from 67.5 to 106 ft and from 113 ft to TD because of the high contamination that produced large dead times in the data acquisition equipment.

The verification spectrum collected before the first run had poorer energy resolution and smaller count rate (by about 15 percent) than did typical spectra. However, the log data for run 1 appear to be normal.

Correction factors for 0.33-in.-thick steel casing were used during data processing, because correction factors for 0.31-in.-thick casing were not available. As a result, the calculated concentrations will be only slightly high.

Cs-137 was the only man-made radionuclide identified. This contaminant was measured from the surface to TD with concentrations to about 7,000 pCi/g. The concentrations in the interval from 67.5 to 106 ft and from 113 ft to TD, where data are not available because of high count rates, would be much greater than 7,000 pCi/g.

The K-40 log indicated a lithology change in the interval from 61 to 64 ft.

The absence of sufficient overlap logging precluded judgment on the repeatability of the data.

See the Tank Summary Data Report for SX-112 for additional log analysis.

Log Plot Notes:

Three log plots are provided. One shows the Cs-137 concentrations. Another shows the naturally occurring radionuclides (K-40, U-238, and Th-232), which can be used for lithology interpretations. A combination plot includes logs of Cs-137, natural gamma, total gamma derived from the spectral data, and data from the WHC Tank Farms gross gamma logging system. The Tank Farms probe is one with a lower sensitivity than presented on the logs for other boreholes around tank SX-112. The headings of the Cs-137 and natural gamma plots identify the specific gamma rays used to calculate the concentrations.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the minimum detectable activity (MDA). The MDA of a radionuclide represents the lowest concentraton at which positive identification of a gamma-ray peak is statistically defensible. If the reported concentration is slightly above the MDA, the 95-percent confidence interval may extend below the MDA value and detection is not assured with 95-percent certainty.

The Tank Farms gross gamma plot is the latest available from WHC. No attempt has been made to adjust the plot for depth discrepancies.